ENGINEERING INDEX PROPERTIES
Franklin County, Kansas

Engineering Index Properties table gives the engineering classifications and the range of index properties for the layers of each soil in the survey area. Depth to the upper and lower boundaries of each layer is indicated. Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. Loam, for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, gravelly. Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998). The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle–size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL–ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A–1 through A–7 on the basis of particle–size distribution, liquid limit, and plasticity index. Soils in group A–1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A–7 are fine grained. Highly organic soils are classified in group A–8 on the basis of visual inspection. If laboratory data are available, the A–1, A–2, and A–7 groups are further classified as A–1–a, A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5, or A–7–6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in Engineering Index Properties table.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry–weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. The estimates of particle–size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

ENGINEERING INDEX PROPERTIES--Continued
Franklin County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
003DB:												
Dennis	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	96-100	65-97	21-36	4-15
	10-14	Silty clay loam	CL	A-6, A-7	0	0	98-100	98-100	94-100	75-98	36-43	15-21
	14-56	Silty clay	CH, CL	A-7	0	0	98-100	98-100	94-100	75-98	43-61	21-35
	56-60				---	---	---	---	---	---	---	---
003EC:												
Eram	0-10	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-43	15-21
	10-33	Silty clay	CH, CL, MH	A-6, A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	33-37	Weathered bedrock			---	---	---	---	---	---	---	---
003LA:												
Lanton	0-8	Silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	90-97	33-42	12-19
	8-36	Silty clay loam	CL	A-6, A-7	0	0	100	100	98-100	90-98	33-42	12-19
	36-48	Silty clay	CH, CL	A-6, A-7	0	0	100	100	98-100	90-98	33-55	12-30
	48-60	Silty clay	CH, CL	A-6, A-7	0	0	100	100	98-100	90-98	40-80	20-50
031EC:												
Eram	0-9	Silt loam	CL	A-4, A-6	0	0	85-100	85-100	85-100	70-95	28-35	9-15
	9-32	Silty clay	CH, CL, MH	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	32-36	Weathered bedrock			---	---	---	---	---	---	---	---
139CM:												
Clareson	0-8	Silty clay loam	CL	A-4, A-6	---	0-25	90-100	90-100	85-95	85-95	30-40	8-18
	8-16	Silty clay loam	CL	A-6, A-7	---	0-65	90-100	90-100	85-95	85-95	35-45	11-20
	16-24	Very flaggy silty clay loam	CH, CL	A-7	---	50-85	85-100	85-100	80-95	80-95	41-60	18-35
	24-32	Unweathered bedrock			---	---	---	---	---	---	---	---
Eram	0-9	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-48	15-25
	9-28	Silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	28-32	Weathered bedrock			---	---	---	---	---	---	---	---
602CB:												
Catoosa	0-12	Silt loam	CL	A-4, A-6	0	0	100	100	96-100	65-97	30-37	8-14
	12-25	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-98	33-48	12-22
	25-29	Unweathered bedrock			---	---	---	---	---	---	---	---
602CM:												
Clareson	0-11	Silty clay loam	CL	A-4, A-6	---	0-25	90-100	90-100	85-95	85-95	30-40	8-18
	11-15	Very flaggy silty clay loam	CL	A-6, A-7	---	0-65	75-95	70-90	65-85	65-85	35-45	11-20
	15-32	Extremely flaggy silty clay	CH, CL	A-7	---	50-85	75-85	60-80	55-75	55-75	41-60	18-35
	33-37				---	---	---	---	---	---	---	---
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
602LA:												
Lanton	0-14	Silt loam	CL, ML	A-4, A-6	0	0	100	100	96-100	80-97	30-37	8-13
	14-53	Silt loam	CL	A-6, A-7	0	0	100	100	98-100	90-98	33-42	12-19
	53-60	Silty clay loam	CH, CL	A-6, A-7	0	0	100	100	98-100	90-98	33-55	12-30
602VC:												
Verdigris	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	22-35	2-13
	9-32	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	22-35	2-13
	32-52	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
	52-60	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
1366:												
Clareson	0-11	Silty clay loam	CL	A-4, A-6	---	0-25	90-100	90-100	85-95	85-95	30-40	8-18
	11-16	Flaggy silty clay loam	CL	A-6, A-7	---	0-65	90-100	90-100	85-95	85-95	35-45	11-20
	16-28	Flaggy silty clay	CH, CL	A-7	---	50-85	85-100	85-100	80-95	80-95	41-60	18-35
	28-33	Flaggy silty clay	CH, CL	A-7	---	50-85	85-100	85-100	80-95	80-95	41-60	18-35
	33-37	Unweathered bedrock			---	---	---	---	---	---	---	---
Rock Outcrop	0-60	Unweathered bedrock			---	---	---	---	---	---	0-14	---
2326:												
Kenoma	0-4	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	85-100	85-100	85-100	25-40	3-18
	4-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	85-100	85-100	85-100	25-40	3-18
	10-18	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	50-75	30-48
	18-27	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	50-75	30-48
	27-41	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	45-65	30-48
	41-59	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	45-65	30-48
	59-73	Silty clay loam	CH, CL	A-7	0	0	85-100	85-100	75-100	75-95	45-65	25-44
2540:												
Leanna	0-10	Silt loam	CL	A-6	0	0	100	100	95-100	85-90	25-35	10-15
	10-22	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	30-45	10-20
	22-40	Silty clay	CH, CL	A-7	0	0	100	100	95-100	90-100	45-60	20-30
	40-55	Silty clay	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-55	15-30
	55-78	Silty clay	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-55	15-30

ENGINEERING INDEX PROPERTIES--Continued
Franklin County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
3494:												
Summit	0-9	Silty clay loam	CH, CL, ML	A-6, A-7	0	0	90-100	85-100	80-100	70-99	35-60	11-30
	9-17	Silty clay	CH, CL	A-6, A-7	0	0	85-100	85-100	75-100	60-99	37-65	15-35
	17-24	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
	24-41	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
	41-61	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
	61-73	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
3815:												
Verdigris	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	22-35	2-13
	9-27	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
	27-32	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
	32-52	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
	52-60	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
3816:												
Verdigris	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	22-35	2-13
	9-27	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
	27-32	Silt loam	CL	A-6, A-7, A-4	0	0	100	100	95-100	80-100	30-45	8-23
	32-52	Silt loam	CL		0	0	100	100	95-100	80-100	30-45	8-23
	52-60	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
3951:												
Woodson	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	5-20
	10-21	Silty clay	CH	A-7-6	0	0	100	95-100	95-100	90-100	50-65	30-45
	21-30	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	50-65	30-45
	30-48	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40
	48-60	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40
AED:												
Arents, Earthen Dam	---	---	---	---	---	---	---	---	---	---	---	---
Bc:												
Bates	0-19	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	19-34		CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	3-20
	34-38		SC, SC-SM	A-2, A-4, A-6	---	0-15	70-90	70-90	50-80	20-40	20-35	5-15
	38-42				---	---	---	---	---	---	---	---
Bd:												
Bates	0-15	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	15-23	Clay loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	8-20
	23-28	Gravelly clay loam	SC, SC-SM, SM	A-2, A-4, A-6	0	0-15	70-90	70-90	50-80	20-40	20-35	8-15
	28-32	Unweathered bedrock			---	---	---	---	---	---	---	---
Collinsville	0-6	Loam	CL, CL-ML, ML	A-4	---	0-15	85-100	85-100	75-95	55-85	22-30	2-10
	6-14	Fine sandy loam	ML, SC, SM, CL-ML, SC-SM, CL	A-2, A-4	---	0-45	55-100	55-100	50-95	20-85	15-30	NP-10
	14-18	Unweathered bedrock			---	---	---	---	---	---	---	---
Bh:												
Bates	0-19	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	19-26	Loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	3-20
	26-34	Gravelly loam	SC, SC-SM	A-2, A-4, A-6	0	0-15	70-90	70-90	50-80	20-40	20-35	5-15
	34-38	Unweathered bedrock			---	---	---	---	---	---	---	---
Collinsville	0-11	Loam	CL, CL-ML, ML	A-4	---	0-15	85-100	85-100	75-95	55-85	22-30	2-10
	11-17	Channery loam	CL, ML, SC, SM	A-2, A-4	---	0-45	55-100	55-100	50-95	20-85	15-30	NP-10
	17-21	Unweathered bedrock			---	---	---	---	---	---	---	---
Bo:												
Bolivar	0-13	Loam	ML	A-4	0	0	100	90-100	70-95	55-75	20-30	NP-5
	13-28	Sandy clay loam	CL, SC	A-6	0	0-10	85-100	85-100	70-95	45-80	25-40	10-25
	28-34	Channery sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	5-20	70-95	70-95	60-90	36-60	25-35	5-15
	34-38	Unweathered bedrock			---	---	---	---	---	---	---	---
Hector	0-9	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	80-100	75-100	70-95	40-75	15-25	NP-7
	9-18	Fine sandy loam	GC-GM, GM, ML, SM	A-1-b, A-2, A-4	0-5	0-15	55-100	55-100	35-95	20-65	15-25	NP-7
	18-22	Unweathered bedrock			---	---	---	---	---	---	---	---
Bs:												
Bolivar	0-13	Loam	ML	A-4	0	0	100	90-100	70-95	55-75	20-30	NP-5
	13-28	Sandy clay loam	CL, SC	A-6	0	0-10	85-100	85-100	70-95	45-80	25-40	10-25
	28-34	Channery sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	5-20	70-95	70-95	60-90	36-60	25-35	5-15
	34-38	Unweathered bedrock			---	---	---	---	---	---	---	---
Hector	0-9	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	80-100	75-100	70-95	40-75	15-25	NP-7
	9-18	Loam	GC-GM, GM, ML, SM	A-1-b, A-2, A-4	0-5	0-15	55-100	55-100	35-95	20-65	15-25	NP-7
	18-22	Unweathered bedrock			---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued
Franklin County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Cm:												
Clareson-------	0-7	Silty clay loam	CL	A-4, A-6	---	0-25	90-100	90-100	85-95	85-95	30-40	8-18
	7-15	Silty clay loam	CL	A-6, A-7	---	0-65	90-100	90-100	85-95	85-95	35-45	11-20
	15-26	Flaggy silty clay loam	CH, CL	A-7	---	50-85	85-100	85-100	80-95	80-95	41-60	18-35
	26-30	Unweathered bedrock			---	---	---	---	---	---	---	---
Eram----------	0-7	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-48	15-25
	7-38	Silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	38-42	Weathered bedrock			---	---	---	---	---	---	---	---
Dc:												
Dennis---------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-97	20-37	1-15
	10-15	Silty clay loam	CL	A-6, A-7	0	0	98-100	98-100	94-100	75-98	33-48	13-25
	15-60	Silty clay	CH, CL	A-6, A-7	0	0	98-100	98-100	94-100	75-98	37-65	15-35
Dn:												
Dennis---------	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	96-100	65-97	21-36	4-15
	10-15	Silty clay loam	CL	A-6, A-7	0	0	98-100	98-100	94-100	75-98	36-43	15-21
	15-60	Silty clay	CH, CL	A-7	0	0	98-100	98-100	94-100	75-98	43-61	21-35
Bates----------	0-19	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	19-26	Loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	3-20
	26-34	Gravelly loam	SC, SC-SM	A-2, A-4, A-6	0	0-15	70-90	70-90	50-80	20-40	20-35	5-15
	34-38	Unweathered bedrock			---	---	---	---	---	---	---	---
Do:												
Dennis, eroded-	0-6	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-97	20-37	1-15
	6-15	Silty clay loam	CL	A-6, A-7	0	0	98-100	98-100	94-100	75-98	33-48	13-25
	15-60	Silty clay	CH, CL	A-6, A-7	0	0	98-100	98-100	94-100	75-98	37-65	15-35
Bates, eroded--	0-6	Clay loam	CL	A-6, A-7	0	0	90-100	85-100	80-100	60-85	35-45	15-20
	6-26	Clay loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	3-20
	26-30	Clay loam	SC, SC-SM	A-2, A-4, A-6	0	0-15	70-90	70-90	50-80	20-40	20-35	5-15
	30-34	Unweathered bedrock			---	---	---	---	---	---	---	---
Ea:												
Eram----------	0-7	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-48	15-25
	7-38	Silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	38-42	Weathered bedrock			---	---	---	---	---	---	---	---
Lebo----------	0-14	Silty clay loam	CL	A-6, A-7-6	---	0-5	95-100	90-100	90-100	80-95	35-50	15-25
	14-28	Very channery silty clay loam	CL	A-6, A-7-6	---	0-5	75-95	55-95	55-85	50-80	35-50	15-25
	28-36	Weathered bedrock			---	---	---	---	---	---	---	---
Ec:												
Eram----------	0-7	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-48	15-25
	7-38	Silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	38-42	Weathered bedrock			---	---	---	---	---	---	---	---
Lula----------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-97	21-37	1-15
	7-12	Silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	30-43	9-20
	12-44	Silty clay loam	CL, CH	A-7	0	0-30	85-100	85-100	80-100	70-100	45-60	20-35
	44-52	Unweathered bedrock			---	---	---	---	---	---	---	---
INT:												
Aquolls--------	0-72	Variable			---	---	---	---	---	---	---	---
Ke:												
Kenoma---------	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	85-100	85-100	85-100	25-40	3-18
	11-34	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	50-75	30-48
	34-60	Silty clay	CH, CL	A-7	0	0	85-100	85-100	75-100	75-95	45-65	25-44
Le:												
Leanna, drained	0-16	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-36	7-15
	16-52	Silty clay	CH, CL	A-7	0	0	100	100	95-100	90-100	43-57	21-32
	52-60	Silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	36-52	15-28
Ln:												
Lebo----------	0-7	Stony silty clay loam	CL	A-6, A-7-6	---	25-50	75-95	55-75	55-70	50-65	35-50	15-25
	7-14	Channery silty clay loam	CL	A-6, A-7-6	---	0-5	75-95	55-95	55-85	50-80	35-50	15-25
	14-28	Very channery silty clay loam	GC, GP-GC, SC, SP-SC	A-2-6, A-2-7	---	0-5	50-75	10-50	5-40	5-35	35-50	15-25
	28-36	Weathered bedrock			---	---	---	---	---	---	---	---
Rock Outcrop---	---	---	---	---	---	---	---	---	---	---	---	---
Lo:												
Lula----------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-97	25-36	7-15
	9-18	Silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	28-43	9-21
	18-57	Silty clay loam	CL	A-6, A-7	0	0-30	85-100	85-100	80-100	70-98	36-43	15-21
	57-65	Unweathered bedrock			---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued
Franklin County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LU:												
Lula	0-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	21-37	1-15
	8-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	14-44	Silty clay loam	CL, CH	A-7	0	0-30	85-100	85-100	80-100	70-100	35-50	10-25
	44-52	Unweathered bedrock			---	---	---	---	---	---	---	---
M-W:												
Miscellaneous Water	---	---	---	---	---	---	---	---	---	---	---	---
Mb:												
Mason	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	96-100	65-98	30-37	8-13
	7-60	Silty clay loam	CL	A-4, A-6, A-7	0	0	98-100	98-100	96-100	65-98	30-43	9-20
Oe:												
Olpe	0-7	Silty clay loam	CL	A-6	0	0	80-100	75-100	60-100	50-95	30-40	10-20
	7-50	Extremely gravelly silty clay loam	CH, CL, GC, SC	A-2, A-6, A-7	0	0	20-80	10-75	10-75	10-70	35-55	15-30
	50-60	Silty clay	CH, CL, GC, SC	A-7	0	0	60-100	50-100	40-100	35-95	40-65	25-40
Kenoma	0-4	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	85-100	85-100	85-100	25-40	3-18
	4-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	85-100	85-100	85-100	25-40	3-18
	10-18	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	50-75	30-48
	18-27	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	50-75	30-48
	27-41	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	45-65	30-48
	41-59	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	45-65	30-48
	59-73	Silty clay loam	CH, CL	A-7	0	0	85-100	85-100	75-100	75-95	45-65	25-44
Os:												
Osage	0-14	Silty clay loam	CL	A-7	0	0	100	100	100	95-100	40-50	20-30
	14-60	Silty clay	CH, CL	A-7	0	0	100	100	100	95-100	40-80	20-50
Ov:												
Osage	0-17	Silty clay	CH	A-7	0	0	100	100	100	95-100	50-75	30-55
	17-60	Silty clay	CH, CL	A-7	0	0	100	100	100	95-100	40-80	20-50
Pt:												
Pits, Quarries	0-60	Variable			---	---	---	---	---	---	---	---
Sn:												
Summit	0-6	Silty clay loam	CH, CL	A-6, A-7	0	0	90-100	85-100	80-100	70-99	35-60	11-30
	6-14	Silty clay loam	CH, CL	A-6, A-7	0	0	85-100	85-100	75-100	60-99	37-65	15-35
	14-57	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
	57-60	Silty clay loam	CH, CL	A-7	0	0	90-100	75-100	70-100	55-98	41-70	18-40
So:												
Summit	0-8	Silty clay loam	CH, CL, MH	A-6, A-7	0	0	90-100	85-100	80-100	70-99	35-60	11-30
	8-13	Silty clay loam	CH, CL, MH	A-6, A-7	0	0	85-100	85-100	75-100	60-99	37-65	15-35
	13-60	Silty clay	CH, CL, MH	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
Vb:												
Verdigris	0-16	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	22-35	2-13
	16-60		CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
Vc:												
Verdigris	0-7	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0	100	100	95-100	65-100	25-36	7-15
	7-60	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	28-43	9-21
W:												
Water	---	---	---	---	---	---	---	---	---	---	---	---
Wb:												
Welda	0-11	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-100	25-35	5-15
	11-50	Silty clay	CL	A-6, A-7-6	0	0	100	100	95-100	85-100	38-50	20-30
	50-60	Silty clay loam	CL, ML	A-4, A-6, A-7-6	0	0	100	100	90-100	75-100	30-45	7-20
Wo:												
Woodson	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	5-20
	8-43	Silty clay	CH	A-7-6	0	0	100	95-100	95-100	90-100	50-65	30-45
	43-60	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40
Wt:												
Woodson	0-7	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	90-100	85-100	25-40	5-20
	7-43	Silty clay, clay	CH	A-7-6	0	0	100	95-100	95-100	90-100	50-65	30-45
	43-60	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40